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PATENT APPLICATION
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IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Algrid M. Gudaitis

Confirmation No.: 3784

Application No.: 09/768,662

Examiner: Heather D. Gibbs

Filing Date: Jan. 23, 2001

Group Art Unit: 2622

Title: Color Measurement With Distributed Sensors In A Color Hard Copy Apparatus

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on May 13, 2005.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( )	one month	$120.00
( )	two months	$450.00
( )	three months	$1020.00
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( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of $500.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Number of pages: 18

Respectfully submitted,

Algrid M. Gudaitis

By _____

Jack H. McKinney

Attorney/Agent for Applicant(s)

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IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTOR(S): Algrid M. Gudaitis

SERIAL NO.: 09/768,662 **GROUP ART UNIT:** 2622

FILED: January 23, 2001 **EXAMINER:** Heather D. Gibbs

SUBJECT: COLOR MEASUREMENT WITH DISTRIBUTED SENSORS IN A COLOR HARD COPY APPARATUS

APPELLANTS'/APPLICANTS' OPENING BRIEF ON APPEAL

1. REAL PARTY IN INTEREST.

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holding, LLC.

2. RELATED APPEALS AND INTERFERENCES.

There are no other appeals or interferences known to Appellants, Appellants' legal representative or the Assignee which will affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS.

Claims 1-21 are pending and stand rejected. All pending claims are appealed.

4. STATUS OF AMENDMENTS.

Claim 16 was amended after the final action was entered. The Examiner entered the amendment for purposes of appeal. No other amendments have been filed after the final action was entered. All previous amendments have been entered.

5. SUMMARY OF CLAIMED SUBJECT MATTER.

Claim 1 recites a system for color measurement for a color hard copy apparatus, having a print media transport path. The system includes an illumination source and a plurality of photodetectors – all adjacent to the path. *See, e.g.*, Specification, page 7, lines 21-23; page 8, lines 8-15; and page 9, lines 19-24. The system also includes test strips each of a single color formed on a sheet of media traveling the path. Each strip has a geometric configuration such that each of the photodetectors detects substantially discrete regions of that strip. *See, e.g.*, Specification, page 7, line 23 through page 8, line 7.

Claim 5 recites a color hard copy apparatus, having a mechanism generating a pattern of test strips of intended uniform colors on media transported along a predetermined path through the apparatus. The apparatus includes a broad band illumination source mounted for illuminating the strips. *See, e.g.*, Specification, page 7, lines 21-23; page 8, lines 8-15; and page 9, lines 19-24 and Fig. 1. The apparatus also includes an array of sensors mounted for detecting color properties of discrete areas of each strip. *See, e.g.*, Specification, page 7, lines 21-23; page 8, lines 8-15; and page 9, lines 19-24 and Fig. 1. The illumination source and the array of sensors are each located adjacent to the path and downstream of the mechanism. *See, e.g.*, Specification, page 7, lines 21-23; page 8, lines 8-15; and page 9, lines 19-24 and Fig. 1.

Claim 9 recites a method for measuring actual color produced by a color hard copy device. The method includes illuminating with broad band light, a region of a color test pattern generated by the device, wherein the region has a first color generated by the device. Specification, page 7, lines 21-23; page 8, lines 13-15; and page 9, lines 19-24 and Fig. 1. Actual color characteristics of discrete areas of that

region are discretely sensed. *See, e.g.*, Specification, page 9, lines 4-14 and 19-23; page 10, lines 7-9; and Fig. 1. Data representative of the color characteristics are stored. *See, e.g.*, Specification, page 10, lines 10-12.

Claim 12 recites a hard copy apparatus that includes a printing engine operable to form a test pattern of color strips on a print medium where each test strip is of an intended uniform color. *See, e.g.*, Specification, page 7, line 23 through page 8, line 7. The apparatus includes an array of sensors located downstream from the printing engine along a direction of travel of the printing medium. *See, e.g.*, Specification, page 7, lines 21-23; page 8, lines 8-15; and page 9, lines 19-24 and Fig. 1. The array of sensors is oriented along an axis that is generally parallel to an orientation of the test strips. *See, e.g.*, Specification, page 9, lines 4-5 and Fig. 1. As each test strip passes within view of the array of sensors, each sensor is positioned to detect a substantially discrete region of that test strip. *See, e.g.*, Specification, page 9, lines 4-14 and 19-23; page 10, lines 7-9; and Fig. 1.

Claim 17 recites a color measurement system for use with a test pattern of color strips formed on a print medium. The system includes an array of photodetectors oriented along an axis that is generally parallel to an orientation of the test strips. *See, e.g.*, Specification, page 7, lines 21-23; page 8, lines 8-15; and page 9, lines 4-5 and 19-24 and Fig. 1. As each test strip passes within view of the array of photodetectors, each photodetector is positioned to measure a spectral characteristic of a substantially discrete region of that test strip as the test strip passes within view of the sensor array. *See, e.g.*, Specification, page 9, lines 4-14 and 19-23; page 10, lines 7-9; and Fig. 1. The system also includes a means for comparing measured spectral characteristics of the test strips with intended spectral characteristics of the test strips. *See, e.g.*, Specification, page 10, line 10 through page 11, line 2.

Claim 19 recites a color measurement method that includes forming a test pattern of color strips on a print medium. *See, e.g.*, Specification, page 10, lines 3-6. An array of photodetectors oriented along an axis that is generally parallel to an orientation of the test strips is provided. *See, e.g.*, Specification, page 7, lines 21-23; page 8, lines 8-15; and page 9, lines 4-5 and 19-24 and Fig. 1. Print media is urged past the array. *See, e.g.*, Specification, page 10, lines 7-9. For each test strip, each photodetector in the array is used to measure a spectral characteristic a substantially

discrete region of that test strip as the test strip passes within view of the array. *See, e.g.*, Specification, page 9, lines 4-14 and 19-23; page 10, lines 7-9; and Fig. 1.

6. GROUNDS FOR REJECTION TO BE REVIEWED.

A. A prima facie case for anticipation has not been established in that Hubble (USPN 6,384,918) does not teach or suggest a plurality of photodetectors and a pattern of test strips each of a single color formed on a sheet of media traveling a path where each strip has a geometric configuration such that each of the photodetectors detects substantially discrete regions of that strip.

B. A prima facie case for anticipation has not been established in that Hubble (USPN 6,384,918) does not teach or suggest an array of sensors mounted for detecting color properties of discrete areas of each strip in a pattern of strips generated on media transported along a predetermined path through an apparatus.

C. A prima facie case for anticipation has not been established in that Hubble (USPN 6,384,918) does not teach or suggest discretely sensing actual color characteristics of discrete areas of an illuminated region of a color test pattern.

D. Prima facie cases for anticipation and obviousness have not been established in that Hubble (USPN 6,384,918), alone or in combination with Lloyd (USPN 5,508,826), does not teach or suggest an array of sensors located downstream from a printing engine along a direction of travel of a printing medium where the array of sensors is oriented along an axis that is generally parallel to an orientation of the a test pattern of color strips so that each sensor is positioned to detect a substantially discrete region of a given test strip as that test strip passes within view of the array of sensors.

E. Prima facie cases for anticipation and obviousness have not been established in that Hubble (USPN 6,384,918), alone or in combination with Lloyd (USPN 5,508,826), does not teach or suggest forming a test pattern of color strips on a print medium and providing an array of photodetectors oriented along an axis that is generally parallel to an orientation of the test strips.

F. Prima facie cases for anticipation and obviousness have not been established in that Hubble (USPN 6,384,918), alone or in combination with Lloyd (USPN 5,508,826), does not teach or suggest using, for each test strip of a pattern of color strips, each photodetector in an array to measure a spectral characteristic a substantially discrete region of that test strip as the test strip passes within view of the array.

7. ARGUMENT.

A. Ground For Rejection A (Claims 1-4) – Hubble fails to teach or suggest a plurality of photodetectors and a pattern of test strips each of a single color formed on a sheet of media traveling a path where each strip has a geometric configuration such that each of the photodetectors detects substantially discrete regions of that strip.

Claims 1-4 were rejected under 35 U.S.C. § 102 as being anticipated by Hubble (USPN 6,384,918). Hubble discloses a spectrometer for measuring colors of test strips on a printed sheet. See Hubble, Abstract. The following image is a reproduction of Hubble, Fig. 2 illustrating a spectrometer (12) used to analyze different colored test patches (31) on a printed sheet (30).

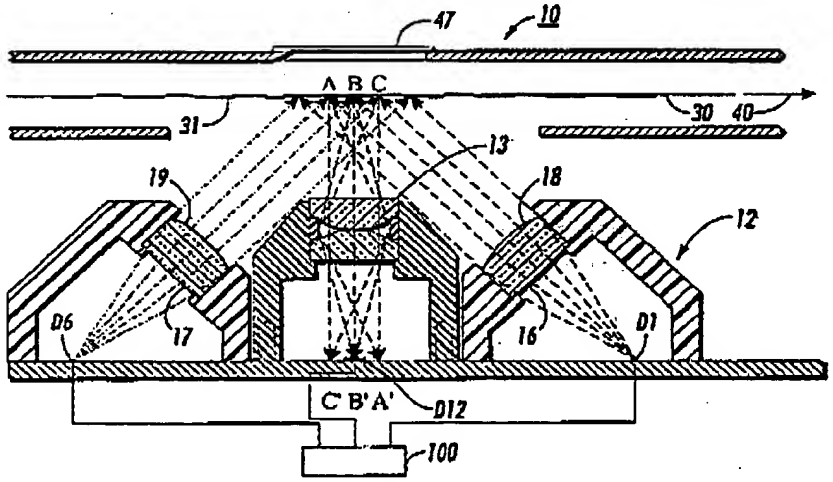

FIG. 2

Hubble's disclosed design includes a circular grouping of LEDs (D1-D10) surrounding a single photo diode detector (D12). Flux from each LED is collimated and directed to be applied to the same test patch (31). A lens then focuses the illuminated test strip on the photo diode detector (D12). Hubble, col. 16, line 58 through col. 17, line 44.

Hubble also mentions that an additional LED emitter and detector (not illustrated) may be used to detect black and white fiduciary or timing marks (33) shown on the test sheet 30 of FIG. 4, reproduced below. Each fiduciary mark (33) indicates the presence of each adjacent test patch (31) in the field of view of the spectrophotometer (12).

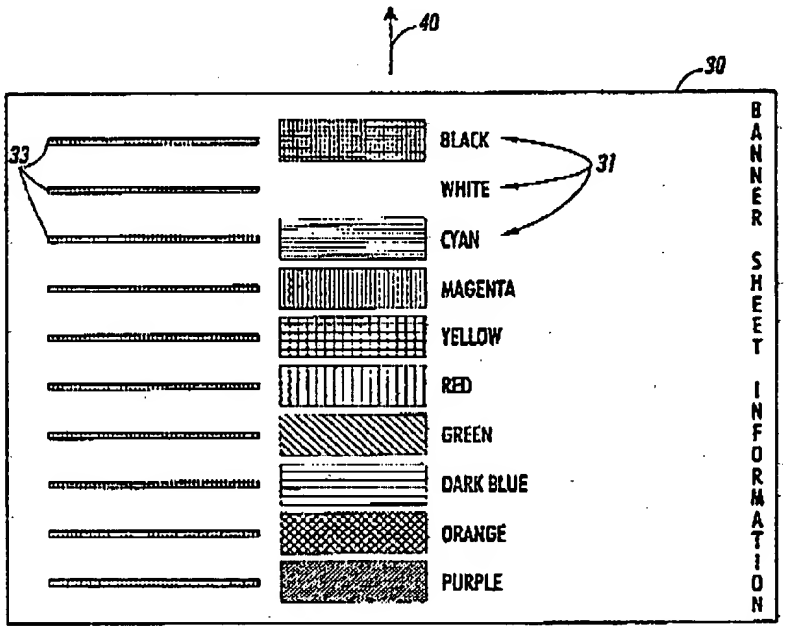

FIG. 4

To summarize, Hubble discloses a spectrometer (12) with a ***single*** photodetector (D12) that is used to read a ***single*** region of a test patch (31). Hubble mentions that a second photodetector may be used to detect the presence of fiduciary marks (33). That second photodetector does not and is not positioned to read test patches (31). Consequently, that second photodetector does not and is not positioned to read a region of a test patch (31) that is discrete with respect to another region of that test same patch (31) read by photodetector (31).

Each of Claims 1-4 (directly or indirectly) recites a plurality of photodetectors and a pattern of test strips each of a single color formed on a sheet of media traveling a path where each strip has a geometric configuration such that each of the photodetectors detects substantially discrete regions of that strip. Hubble's teachings to not meet these requirements. Hubble discloses one photodetector (D12) that reads a test patch (31) and a second photodetector that detects fiduciary marks (33). Hubble's second photodetector does not read test patches (31). Only the photodetector (D12) reads test patches (31). Consequently, test patches (31) do not have a geometric configuration that allow each of Hubble's photodetector (D12) and Hubble's second photodetector to detect, for each test patch (31), a discrete region of that test patch (31) in the manner required by Claims 1-4.

As such, the rejection of Claims 1-4 is improper as the Examiner failed to establish a prima facie case for anticipation under 35 USC §102.

B. Ground For Rejection B (Claims 5-8) – Hubble (USPN 6,384,918) does not teach or suggest an array of sensors mounted for detecting color properties of discrete areas of each strip in a pattern of strips generated on media transported along a predetermined path through an apparatus.

Claims 5-8 were rejected under 35 U.S.C. § 102 as being anticipated by Hubble (USPN 6,384,918). Each of Claims 5-8 (directly or indirectly) recites an array of sensors mounted for detecting color properties of discrete areas of each strip in a pattern of strips generated on media transported along a predetermined path through an apparatus.

As clarified above, Hubble teaches a single photodetector (D12) for reading test patches (31). Hubble teaches a second photodetector for detecting fiduciary marks (33). Hubble, however, does not disclose an array of sensors mounted for detecting color properties of discrete areas of each test strip in the manner required by Claims 5-8. Instead, Hubble's single photodetector (D12) reads a single area or region of a test patch (31). Restated, Hubble teaches sequentially illuminating a common region of a test patch (31) and sequentially recording output responses of a single photodetector (D12). Hubble, col. 16, line 58 through col. 17, line 44.

As such, the rejection of Claims 5-8 is improper as the Examiner failed to establish a prima facie case for anticipation under 35 USC §102.

C. Ground For Rejection C (Claims 9-11) – Hubble (USPN 6,384,918) does not teach or suggest discretely sensing actual color characteristics of discrete areas of an illuminated region of a color test pattern.

Claims 9-11 were rejected under 35 U.S.C. § 102 as being anticipated by Hubble (USPN 6,384,918). Each of Claims 9-11 (directly or indirectly) recites discretely sensing actual color characteristics of discrete areas of an illuminated region of a color test pattern.

As clarified above, Hubble does not disclose discretely sensing actual color characteristics of discrete areas of a given region of a test patch (31) in the manner required by Claims 9-16. Instead Hubble teaches sequentially illuminating a common or single region of a test patch (31). Hubble's photodetector (D12) does not sense discrete areas of the test patch (31). *See, e.g.*, Hubble, col. 16, line 58 through col. 17, line 44.

As such, the rejection of Claims 9-11 is improper as the Examiner failed to establish a prima facie case for anticipation under 35 USC §102.

D. Ground For Rejection D (Claims 12-18) – Hubble (USPN 6,384,918) and Lloyd (5,508,826) do not teach or suggest an array of sensors located downstream from a printing engine along a direction of travel of a printing medium where the array of sensors is oriented along an axis that is generally parallel to an orientation of the a test pattern of color strips so that each sensor is positioned to detect a substantially discrete region of a given test strip as that test strip passes within view of the array of sensors.

Claims 12-14 and 17 were rejected under 35 U.S.C. § 102 as being anticipated by Hubble (USPN 6,384,918). Claims 15, 16, and 18 were rejected as being unpatentable over Hubble in view of Lloyd (USPN 5,508,826). Each of Claims 12-18 (directly or indirectly) recites an array of sensors located downstream from a printing engine along a direction of travel of a printing medium where the array of sensors is oriented along an axis that is generally parallel to an orientation of the a test pattern of color strips so that each sensor is positioned to detect a substantially discrete region of a given test strip as that test strip passes within view of the array of sensors. With

respect to each of Claims 12-18, the Examiner contends that Hubble teaches such an array.

As clarified above and contrary to the Examiner's contentions, Hubble does not teach such a sensor array. Specifically, Hubble does not teach an array of sensors where each sensor is positioned to detect a discrete region of a test strip in the manner required by Claims 12-14. Hubble teaches a first sensor (D12) that reads test patches (31) and a second sensor that detects fiduciary marks (33). Hubble mentions nothing of an array or even a grouping of sensors where each sensor can detect a discrete region of a single test strip in the manner required by Claims 12-14.

As such, the rejection of Claims 12-14 and 17 is improper as the Examiner failed to establish a prima facie case for anticipation under 35 USC §102. The rejection of Claims 15, 16, and 18 is improper as the Examiner failed to establish a prima facie case for obviousness under 35 USC §103.

E. Ground For Rejection E (Claims 19-21) – Hubble (USPN 6,384,918) and Lloyd (5,508,826) do not teach or suggest forming a test pattern of color strips on a print medium and providing an array of photodetectors oriented along an axis that is generally parallel to an orientation of the test strips.

Claims 19 and 20 were rejected under 35 U.S.C. § 102 as being anticipated by Hubble (USPN 6,384,918). Claim 21 was rejected as being unpatentable over Hubble in view of Lloyd (USPN 5,508,826). Each of Claims 19-21 (directly or indirectly) recites forming a test pattern of color strips on a print medium and providing an array of photodetectors oriented along an axis that is generally parallel to an orientation of the test strips. With respect to each of Claims 19-21, the Examiner contends that Hubble teaches forming such a test pattern.

As clarified above and contrary to the Examiner's contentions, Hubble does not teach such a test pattern. Specifically, Hubble's photodetector (D12) and second photodetector are not oriented along an axis that is parallel to the orientation of Hubble's test strips (31). *See, e.g.*, Hubble, Fig. 4.

As such, the rejection of Claims 19 and 20 is improper as the Examiner failed to establish a prima facie case for anticipation under 35 USC §102. The rejection of Claim 21 is improper as the Examiner failed to establish a prima facie case for obviousness under 35 USC §103.

F. Ground For Rejection F (Claims 19-21) – Hubble (USPN 6,384,918) and Lloyd (5,508,826) do not teach or suggest using, for each test strip of a pattern of color strips, each photodetector in an array to measure a spectral characteristic a substantially discrete region of that test strip as the test strip passes within view of the array.

Claims 19 and 20 were rejected under 35 U.S.C. § 102 as being anticipated by Hubble (USPN 6,384,918). Claim 21 was rejected as being unpatentable over Hubble in view of Lloyd (USPN 5,508,826). Each of Claims 19-21 (directly or indirectly) recites using, for each test strip of a pattern of color strips, each photodetector in an array to measure a spectral characteristic a substantially discrete region of that test strip as the test strip passes within view of the array. With respect to each of Claims 19-21, the Examiner contends that Hubble teaches using photodetectors in such a manner.

As clarified above, Hubble teaches a single photodetector (D12) for reading test patches (31). Hubble teaches a second photodetector for detecting fiduciary marks (33). Hubble, however, does not disclose using each of an array of photodetectors to measure color properties of a substantially discrete region of that test strip in the manner required by Claims 19-21. Instead, Hubble's single photodetector (D12) reads a single area or region of a test patch (31). Restated, Hubble teaches sequentially illuminating a common region of a test patch (31) and sequentially recording output responses of a single photodetector (D12). Hubble, col. 16, line 58 through col. 17, line 44.

As such, the rejection of Claims 19 and 20 is improper as the Examiner failed to establish a prima facie case for anticipation under 35 USC §102. The rejection of Claim 21 is improper as the Examiner failed to establish a prima facie case for obviousness under 35 USC §103.

Respectfully submitted,
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APPENDIX OF CLAIMS INVOLVED IN THE APPEAL

1. A system for color measurement for a color hard copy apparatus, having a print media transport path, comprising:

an illumination source adjacent to said path;

a plurality of photodetectors adjacent to said path; and

test strips each of a single color formed on a sheet of media traveling said path, each strip having a geometric configuration such that each of said photodetectors detects substantially discrete regions of that strip.

2. The system as set forth in claim 1, further comprising:

said photodetectors having predetermined spectral responses.

3. The system as set forth in claim 1 wherein the illumination source is broadband.

4. The system as set forth in claim 1, further comprising:

a white calibration target mounted within the field of view of all of said sensors.

5. A color hard copy apparatus, having a mechanism generating a pattern of test strips of intended uniform colors on media transported along a predetermined path through said apparatus, comprising:

adjacent said path downstream of the mechanism, a broad band illumination source mounted for illuminating said strips; and

adjacent said path downstream of the mechanism, an array of sensors mounted for detecting color properties of discrete areas of each strip.

6. The apparatus as set forth in claim 5, comprising:

said sensors having predetermined spectral responses.

7. The apparatus as set forth in claim 5 wherein the illumination source is broadband.

8. The apparatus as set forth in claim 5, further comprising:

a white calibration target mounted within the field of view of all of said sensors.

9. A method for measuring actual color produced by a color hard copy device comprising the steps of:

a) illuminating with broad band light, a region of a color test pattern generated by the device, wherein said region has a first color generated by the device;

b) discretely sensing actual color characteristics of discrete areas of said region; and

c) storing data representative of said color characteristics.

10. The method as set forth in claim 9, comprising the further steps of:

printing a plurality of intended colors in addition to said first color with said device, and

repeating steps a)-c) for each of the plurality of intended colors other than said first color.

11. The method as set forth in claim 9, comprising the further step of:

prior to steps a) - c), calibrating each of said sensors using a white calibration target.

12. A hard copy apparatus, comprising:

a printing engine operable to form a test pattern of color strips on a print medium, each test strip being of an intended uniform color; and

an array of sensors located downstream from the printing engine along a direction of travel of the printing medium, the array of sensors being oriented along an axis that is generally parallel to an orientation of the test strips, wherein as each test strip passes within view of the array of sensors, each sensor is positioned to detect a substantially discrete region of that test strip.

13. The hardcopy apparatus of Claim 12, further comprising an illumination source positioned to project incident light to illuminate each test strip as that test strip passes within view of the sensor array.

14. The hardcopy apparatus of Claim 12, wherein each sensor comprises a photodetector operable to measure a spectral characteristic of each test strip as the test strip passes within view of the sensor array is a photo.

15. The hardcopy apparatus of Claim 14, further comprising a means for comparing a measured spectral characteristics of the test strip with intended spectral characteristics of the test strips.

16. The hardcopy apparatus of Claim 15, further comprising a means for generating correction factors based on the comparisons for use by the printing engine.

17. A color measurement system for use with a test pattern of color strips formed on a print medium, comprising:

an array of photodetectors oriented along an axis that is generally parallel to an orientation of the test strips, wherein as each test strip passes within view of the array of photodetectors, each photodetector is positioned to measure a spectral characteristic a substantially discrete region of that test strip as the test strip passes within view of the sensor array; and

a means for comparing measured spectral characteristics of the test strips with intended spectral characteristics of the test strips.

18. The system of Claim 17, further comprising a means for generating correction factors based on the comparisons for use by a printing engine that formed the test strips.

19. A color measurement method, comprising:

forming a test pattern of color strips on a print medium;

providing an array of photodetectors oriented along an axis that is generally parallel to an orientation of the test strips;

urging the print media past the array; and

for each test strip, using each photodetector in the array to measure a spectral characteristic a substantially discrete region of that test strip as the test strip passes within view of the array.

20. The method of Claim 19, further comprising comparing a measured spectral characteristic of a particular test strip with an intended spectral characteristic of that test strip.

21. The method of Claim 20, further comprising generating a correction factor based on the comparison for use by a printing engine that formed the particular test strip.

Please add the status identifiers to each of the claims according to the convention indicated in the CFR rules for office action responses. I do not see where this is required in the CFR rules for appeals, but just in case. If you know of a specific reason not to do this, please let me know. Thanks.

Gregg

Evidence Appendix

There is no extrinsic evidence to be considered in this Appeal. Therefore, no evidence is presented in this Appendix.

Related Proceedings Appendix

There are no related proceedings to be considered in this Appeal. Therefore, no such proceedings are identified in this Appendix.